

Happy Creek stream banks below the bridge will be unstable until the aggraded channel is lowered to its natural grade. It is likely that a large flood would overtop the channel and cause additional bank erosion, possibly creating an entirely new channel in the lowermost 150 feet of the stream.

Rehabilitation of Fish Habitat

Installation of two riprap constrictions in the lower reaches of the stream would help the stream scour small pools out of the aggraded stream bottom. If the stream maintains its present alignment as excess bedload is flushed from the system, the riprap constrictions would remain to form larger, permanent stream pools that would be used by juvenile coho salmon.

Riprap constrictions would be installed within 100 feet of the high tide confluence of Happy Creek with the Wilson River (Figure 1). Construction details of each constriction are typified on a sheet titled "Riprap Constriction for Fish Habitat Enhancement" (attached). Construction rock would be large angular boulders from a nearby rock pit. Each boulder would be larger than 3 feet in at least one dimension and would weigh 1000 to 3000 pounds. About 30 large boulders would be needed for the rehabilitation structures.

Riprap constrictions would extend about 5 feet out into the stream channel from each bank. At the stream bank, riprap would be about 5 feet high, tapering down to 2 feet high in the "middle" of the channel. Each structure would be about 15 feet long; there would be approximately 40 feet of stream channel between the two constrictions.

Riprap constrictions would be imbedded into the stream bottom and banks approximately 2 feet. This would minimize shifting of the riprap as Happy Creek flushes accumulated bedload from its channel. Stream bottom materials excavated to allow riprap placement would be piled on the bank above the apparent high water mark. A small pool would be excavated downstream of each constriction to initiate stream pool formation. Gravel, boulders, and sand scooped out of the stream bottom would be used to backfill spaces between the large riprap boulders.

Placement of the riprap constrictions would require the use of a front end loader in the stream for approximately 4 hours. A 15 foot long section of stream bank near the bridge would be cleared and graded to permit the loader to get into the stream. Driving the loader 200 feet down the stream would cause a minor amount of streambed disruption. Work in the stream would increase turbidity in Happy Creek and would disturb most of the fish in the creek. Resident fish would return and water quality would improve to pre-construction levels within a day.

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SPORT FISH DIV.
REGION I

Introduction

Happy Creek is a small, steep stream that drains into the Wilson River near Heading No. 2 (Station 114+22) of the Quartz Hill Molybdenum Project. A series of waterfalls restricts fish habitat to the lowermost 300 feet of the stream. Coho salmon use pools in the lower reaches of Happy Creek as rearing areas and a few coho probably spawn in the stream each year. A small number of pink salmon spawn where Happy Creek meets the Wilson River.

Fish habitat in Happy Creek was damaged in the Fall of 1982 by several events, which are summarized below:

9/13/82 - 9/25/82

Thirteen pieces of equipment (dump trucks, front end loader, etc.) were driven up the stream, requiring the removal of in-stream logs and brush. Some leveling of the stream bottom occurred to form a relatively flat route for equipment access.

10/5/82 - 10/10/82

A log culvert installed at the approximate upstream boundary of fish habitat was overtopped and washed out by a large storm. An undetermined amount of roadway fill washed into the stream after the culvert was destroyed by high water. Gravel and shot rock from the road fill deposited in the stream and deflected high stream flows towards the banks of Happy Creek, resulting in a substantial amount of erosion and bank collapse. A large mass of gravel flushed down the creek and deposited in the Wilson River.

10/11/82 - 11/6/82

Eroding stream banks below the road crossing were riprapped to prevent additional bank erosion. The log culvert was replaced with a bridge to prevent another road washout.

As a result of channel alterations for equipment access and the road washout, the lower 300 feet of stream channel in Happy Creek is very unstable. Large logs and brush in the stream, which helped stabilize the channel and created rearing pools, were removed when equipment was driven up the stream. A large amount of gravel, shot rock, stream bank material, etc. was deposited in the stream after the culvert washed out. This material has buried rearing pools, reduced the capacity of the channel to contain high flows, and has exceeded the stream's ability to carry bedload. It appears that the stream channel has been raised (aggraded) 2 to 3 feet by the excess bedload sediment.

Natural Recovery

Large rearing pools will not be re-established until excessive streambed materials are flushed down the stream and deposited in the Wilson River. It is expected that high flows in Happy Creek will eventually (within 5 years) establish a new channel 2 to 3 feet lower than the aggraded channel that now exists.